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ABSTRACT

This report summarizes the results of a study conducted to provide a complete and documented picture of public secondary education in Massachusetts. The study involved an analysis of questionnaire data and transcripts from about 3,000 graduates in the 1984 school year. Specifically, the study addressed the following questions: (1) How do student distribute their coursework among subject areas? (2) How much academic coursework do students take? (3) How does the coursework of Massachusetts students compare with that of students in the rest of the country? (4) How much of students' coursework is taken in more demanding courses? (5) How is coursework related to requirements? and (6) What particular patterns of coursework exist among Massachusetts students? Students in special programs such as special education, vocational education, and bilingual education were excluded from the study. The report's final section describes the coursework patterns of three types of students: (1) those with a strong academic orientation; (2) those with a strong occupational orientation; and (3) those with a "non-directed" or general orientation. (JD)

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COURSE TAKING AMONG MASSACHUSETTS HIGH SCHOOL STUDENTS

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COURSE TAKING
AMONG MASSACHUSETTS HIGH SCHOOL STUDENTS

JUNE 1985

BUREAU OF RESEARCH AND ASSESSMENT

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EXECUTIVE SUMMARY

This report, the first of two volumes, summarizes the results of a study conducted by the Department of Education on the coursework of Massachusetts high school students. The aim of the study was to provide a more complete and documented picture of public secondary education than currently exists.

Specifically, the study was designed to address the following questions:

- How do students distribute their coursework among subject areas?
- How much academic coursework do students take?
- How does the coursework of Massachusetts students compare with that of students in the rest of the country?
- How much of students' coursework is taken in more demanding courses?
- How is coursework related to requirements?
- What particular patterns of coursework exist among Massachusetts students?

The study involved an analysis of questionnaire data and transcripts from about 3,000 graduates from the Class of 1984. This sample, selected from schools representing large cities, industrial and residential suburbs and other types of communities, represents a somewhat more academic group of students than comprised the entire population of the 1984 graduates because students in special programs, such as special education, vocational and bilingual programs, were excluded from the study.

The study's findings show that Massachusetts students:

- averaged over 5 full courses a year with 4 of these in major academic areas.
- averaged over half of their total coursework at the college preparatory level.
- averaged almost one more academic course per year than their national counterparts.
- far exceeded the participation rate of students nationwide in traditional courses such as Algebra I, Biology, Chemistry, Geometry and Calculus.

- generally took a similar number of academic courses regardless of the minimum years of coursework required in particular schools.

- spent as much time per week on homework as students nationally, although almost 42% reported fewer than four hours of homework per week.

- devoted a substantial portion of their time to paid employment, with 54% working more than 14 hours per week.

The distribution of the coursework of Massachusetts students in major curriculum areas shows that:

- 96.0% took at least 4 years of English.

- 75.1% took at least 3 years of social studies.

- 76.9% took at least 3 years of mathematics.

- 66.6% took at least 3 years of science.

- 66.2% took at least 2 years of foreign language.

- 37% of the students planning to attend a four-year college would fulfill, at the college preparatory level, the admissions requirements established by the Massachusetts Board of Regents for the class of 1987.

- 77% of the students planning to attend a four-year college would fulfill the admissions requirements established by the Massachusetts Board of Regents if any level of coursework were considered.

- 20.6% took at least 4 years of business.

The report's final section describes the coursework patterns of three types of students whose patterns of coursework were significantly different from the norm described above:

- Those with a strong academic orientation who took at least four courses in each of four or more academic areas.

- Those with a strong occupational orientation who took more than four courses in either business, industrial arts or home economics. (Students in Chapter 74 vocational education programs were excluded from the study.)

- Those with a "non-directed" or general orientation whose coursework included a large percentage of lower level courses and lacked a strong focus in either an academic or occupational direction.

The study describes the coursework patterns of these three groups, which together represent slightly less than half of the high school population, and raises the question of the impact of minimum graduation requirements on these students.

The study's second volume will examine the characteristics of students enrolled in different course-taking patterns and will address issues and concerns involving tracking, equity and differences in course content.

Table of Contents

List of Figures and Tables	Page
I. Description of the Study	1
A. Purpose	1
B. Methodology	2
II. Description of the Sample	5
III. Aggregate Description of Course-Taking	11
A. Availability of Courses	11
B. Description of Coursework	12
C. Coursework and Requirements	22
IV. Course-Taking Patterns	27
A. High Academic Curriculum	29
B. Occupational Curriculum	34
C. Non-directed Curriculum	39
D. Discussion	42
V. Summary	45

List of Tables and Figures

		Page
Table 1	Sample Characteristics	5
Table 2	Participation in Non-Academic Coursework	16
Table 3	Years of Coursework By Subject Area	17
Table 4	College Preparatory Coursework By Subject Area	19
Table 5	Participation in Specific Coursework	20
Table 6	Curriculum Balance	20
Table 7	Comparison of Curriculum Balance	21
Table 8	Massachusetts Board of Regents' Requirements for College Admissions	23
Table 9	Students Fulfilling Regents' Requirements	23
Table 10	Coursework and Regents' Requirements By Subject	24
Table 11	College-Bound Students Fulfilling Requirements	25
Table 12	Coursework and Requirements	26
Table 13	Distribution of Students by Curriculum Category	28
Table 14	Characteristics of Students in High Academic Curriculum	29
Table 15	Curriculum Balance - High Academic Curriculum	31
Table 16	College Preparatory Coursework by Subject Area - High Academic Curriculum	32
Table 17	Characteristics of Students in Occupational Curriculum	35
Table 18	Curriculum Balance - Occupational Curriculum	36
Table 19	College Preparatory Coursework by Subject Area - Occupational Curriculum	37
Table 20	Characteristics of Students in Non-directed Curriculum	39
Table 21	Curriculum Balance -Non-directed Curriculum	41
Table 22	College Preparatory Coursework by Subject Area - Non-directed Curriculum	41

		Page
Figure 1	Kind of Community	5
Figure 2	Post-High School Plans	6
Figure 3	Parents' Education	7
Figure 4	Homework and Paid Employment	8
Figure 5	Mean Years of Coursework By Subject Area	13
Figure 6	Distribution of Years of Coursework By Subject Area - English, Social Studies, Mathematics	14
Figure 7	Distribution of Years of Coursework By Subject Area - Science, Foreign Language, Business	15
Figure 8	Mean Years of Coursework By Subject Area - High Academic Curriculum	30
Figure 9	Homework and Paid Employment - High Academic Curriculum	33
Figure 10	Mean Years of Coursework By Subject Area - Occupational Curriculum	35
Figure 11	Homework and Paid Employment - Occupational Curriculum	38
Figure 12	Mean Years of Coursework By Subject Area - Non-directed Curriculum	40
Figure 13	Homework and Paid Employment - Non-directed Curriculum	43

I. DESCRIPTION OF THE STUDY

A. Purpose

The condition of secondary school education is a major concern of current educational reform discussions. These discussions often define the problem of high school education as the weakening of the high school curriculum caused, in part, by a decrease in requirements and a corresponding increase in student freedom to choose courses. This perception of the problem suggests the policy solution of increasing graduation requirements and thereby reducing student choice.

In order to examine this direction for improving secondary education, the Massachusetts Department of Education reported in August, 1984, on the graduation requirements that school districts in Massachusetts have established for their students. Such requirements, however, have substantial limitations as an indicator of the perceived problems of secondary education.

First, graduation requirements typically specify the minimum quantity of time (in years of coursework) a student must devote to the study of various subject areas. Students still have a substantial amount of choice in their total coursework. Knowledge of graduation requirements provides no insight into this portion of students' curricula.

Second, even when requirements specify the minimum years of coursework in a subject area, students choose the particular courses to fulfill the requirement. Schools typically offer a variety of courses representing a wide range of knowledge that students may elect to fulfill graduation requirements. Without information on these specific course choices, understanding of even the minimum high school experience is limited.

In order to improve understanding of the nature of the high school experience, the Massachusetts Department of Education conducted a study of the coursework patterns of Massachusetts high school students. By examining what courses students have actually taken during high school, a more complete picture of a secondary school education should result.

Specifically, the study was designed to address the following questions:

- How do students distribute their coursework among subject areas?
- How much academic coursework do students take?
- How does the coursework of Massachusetts students compare with that of students in the rest of the country?
- How much of students' coursework is taken in more demanding courses?

- How is coursework related to requirements?
- What particular patterns of coursework exist among Massachusetts students?

B. Methodology

The study of student coursework involved a sample of Massachusetts students from the Class of 1984. The research design included three components:

- Administration of a questionnaire to students
- Collection of course information from student transcripts
- Examination of course content in a small sub-sample of schools

1. Sampling Design

The curriculum study employed a two-stage, stratified sampling design. The first stage involved random selection of comprehensive high schools from within each of the following kind of community categories: KOC 1 - Big Cities; KOC 2 - Industrial Suburbs; KOC 3 - Residential Suburbs; and KOC 4 - Other Communities.

The second stage of the sample selection process selected students from the total eligible enrollment in these schools, with oversampling to allow for sufficient minority representation.

The eligible enrollment consisted of students who were not involved in bilingual programs, alternative programs, substantially separate special education programs or Chapter 74 vocational programs. These excluded students comprised approximately 14.0% of the twelfth grade enrollment. In addition, students who had transferred from other high schools (approximately 10%) were eliminated from the sample because of the difficulty of evaluating the courses found on their transcripts.

While it is not possible to know exactly how the inclusion of these other groups would alter the results of this study, it is possible that the eligibility criteria used has produced a slightly more academic sample than if the sample represented all students. In particular, special education, bilingual, and alternative program students might take a somewhat less academic program than other high school students. On the other hand, the Department's August, 1984 study of graduation requirements showed that students in vocational schools are subject to substantially higher graduation requirements in the academic areas than students in other types of high schools. Thus, the nature and the extent of the differences caused by the sampling procedure are impossible to state exactly.

It should be noted, moreover, that the largest single group of ineligible students were transferees from other schools. No obvious differences exist between the coursework of such students and that of other students.

This sampling design allows generalizations to be made to students in Massachusetts, students in each kind of community and minority students in Massachusetts. The data from the study are not generalizable to schools in Massachusetts, to schools in each kind of community or to individual schools in the study. In addition, no reasonable estimates for minority sub-groups are possible within the limitations of the sampling design.

2. Components of the Research

The first stage of the research involved a questionnaire administered to all students in the sample eliciting information on their sex, race, post-high school plans, parents' educational attainment, amount of homework and paid employment. A summary of the responses to the questionnaire items is found in Section II of this report.

The transcript analysis involved the development of a comprehensive system of classifying courses and translation of the courses found on student transcripts to the categories of this system. The classification scheme consisted of a meaningful and efficient list of courses or course categories with which to organize the course information. In addition, it used a generic system of academic levels that incorporated the leveling practices found in schools. The leveling categories used in this scheme were:

Category 1 - Courses intended to prepare students for admission to extremely competitive four-year colleges.

Category 2 - Courses intended to prepare students for admission to most four-year colleges and more selective two-year colleges.

Category 3 - Courses intended to prepare students for other post-secondary training and education as well as immediate employment.

Category 4 - Courses intended to serve a heterogeneous group of students or those courses that do not fit into one of the other categories.

Category 5 - Courses intended to focus on remediation of basic skills.

The development of this scheme involved examination of the catalogs of course offerings from Massachusetts high schools, discussions with curriculum specialists from several high schools and adaptation of classification schemes used in prior studies.

The design and implementation of a reliable process for matching courses to the scheme included information drawn from the school catalogs and input from personnel of each school in the study. Each course offered by the sample schools was matched to the classification scheme categories prior to data collection.

Information was collected from student transcripts on the courses for which credit had been awarded and the number of years of coursework the course represented. The data collected did not include when the course was taken or the grade earned.

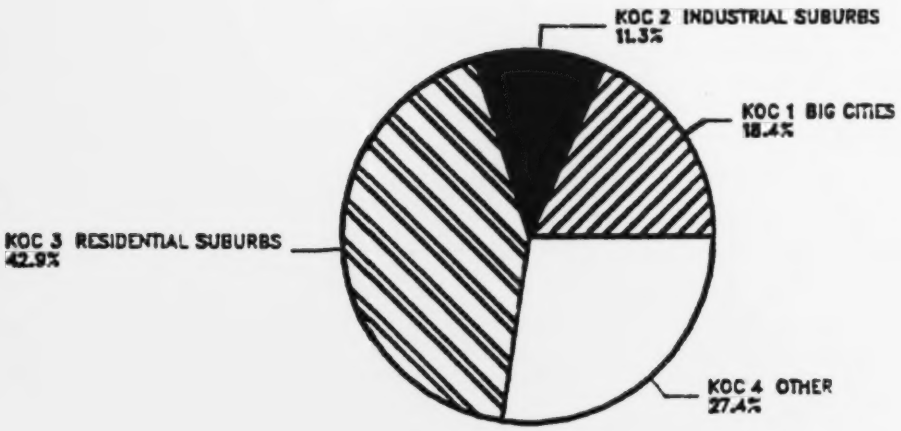
The schools in the study used a variety of systems for awarding credit to a course. For this study, a standard unit of credit - equal to one year of coursework - was adopted. The data collection process related the credits appearing on a student transcript to this standard unit of credit.

II. DESCRIPTION OF THE SAMPLE

The final sample of 2898 students represented each of the four kinds of communities in proportion to the statewide student enrollment in each KOC. Figure 1 displays the sample classified by KOC.

FIGURE 1

KIND OF COMMUNITY



Demographic characteristics collected for the sample on sex and race/ethnicity are summarized in Table 1 below.

TABLE 1

SAMPLE CHARACTERISTICS

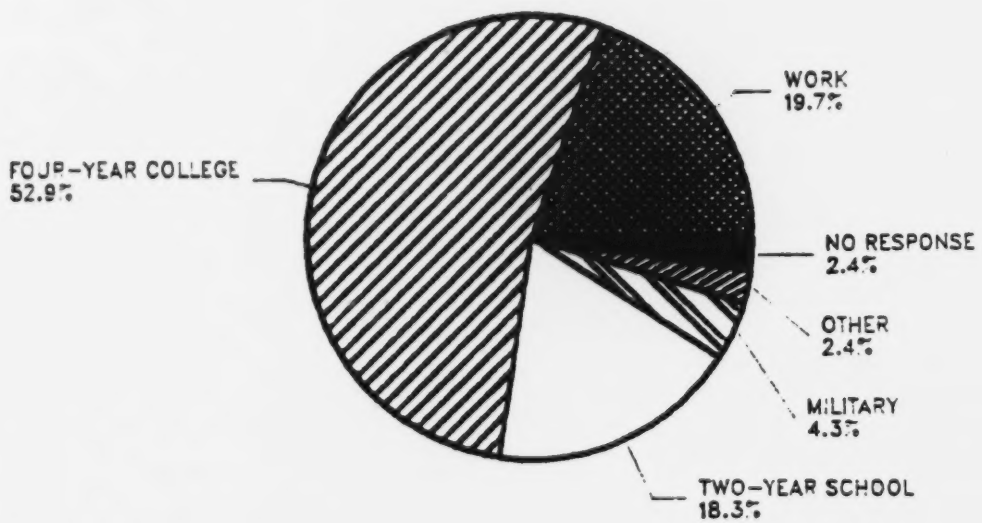
SEX		RACE/ETHNICITY	
Male	44%	White	93.2%
Female	56%	Black	2.2%
		Hispanic	1.2%
		Other	1.2%
		No response	2.2%

Students in the sample had an average SAT verbal score of 438 and a mean mathematics score of 483. The participation rate for the sample was 66.7%. These figures are all slightly higher than the state averages (429 and 467, respectively) and tend to support the idea that the sample represents a somewhat more academic group of students than the general population of the Class of 1984.

The questionnaire elicited from students information on their post-high school plans. Their responses to this question are given in Figure 2.

FIGURE 2

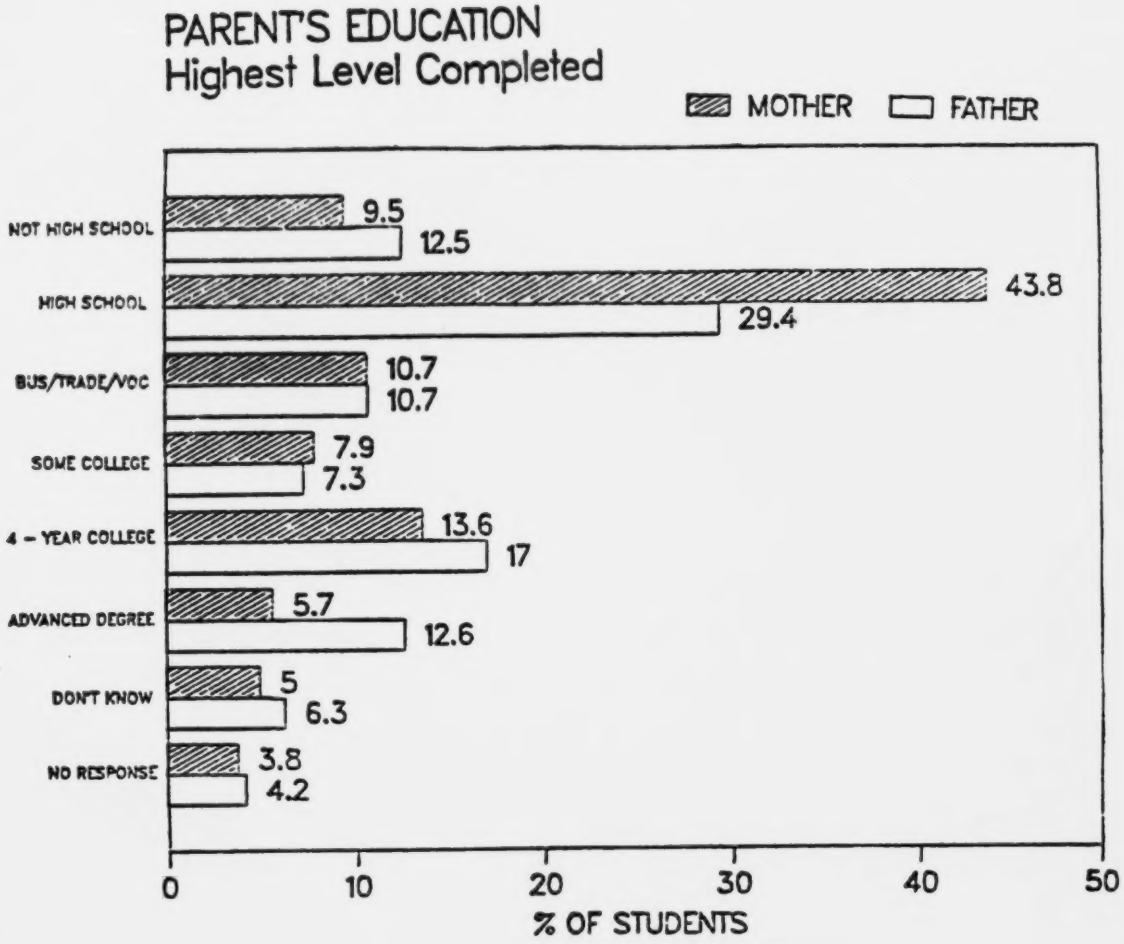
POST-HIGH SCHOOL PLANS



Slightly more students in the sample had college plans than as reported in the Department of Education's annual report on the "Distribution of High School Graduates." Again, this indicates that the sample may be a slightly more academic group than the general population of high school graduates.

Figure 3 below summarizes the responses for both mothers' and fathers' educational attainment. In addition, 10.6% of the responses to the question on fathers' educational attainment were either "Don't Know" or "No Response." For the question on mothers' education, 8.8% of the responses were in these two categories.

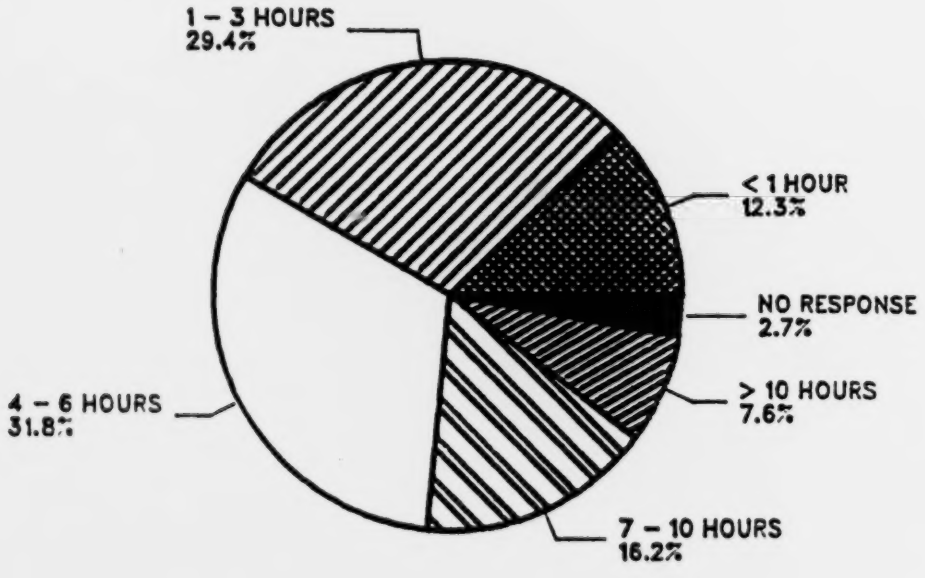
FIGURE 3



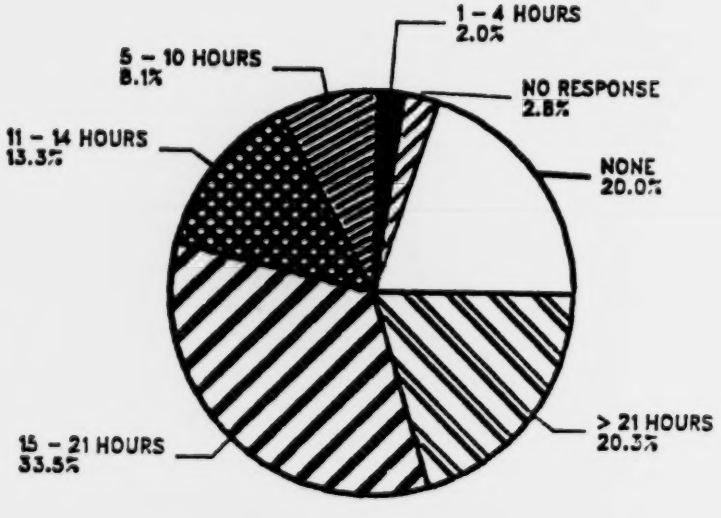
Responses to questions on amount of paid employment and homework are reported in Figure 4.

FIGURE 4

HOURS OF HOMEWORK *



HOURS OF PAID EMPLOYMENT *



* Responses represent hours per week

Figure 4 shows that, as reported in May of their senior year, 56% of the students spent at least four hours on homework each week (including during study halls).

More than three-fourths of the students reported some weekly paid employment during the year. The data presented in Figure 4 indicate that a substantial number of students worked more than the equivalent of one eight hour day per week. Slightly more than 67% of the students reported working at least 11 hours per week. One-fifth of the students worked more than 21 hours per week. It is reasonable to assume that, because the questionnaire was administered in May of the senior year, higher percentages of student employment were shown than if the responses were collected at another time. The data suggest, however, that paid employment is very common among high school students and that for many students it accounts for a significant portion of their week.

III. AGGREGATE DESCRIPTION OF COURSE-TAKING

A. Availability of Courses

While there are numerous factors that influence course selection by students, the availablity of a course within a particular school's course offerings places a clear limit on the ability of a student to take that course. The students in the study attended schools that represented a diversity of course offerings. However, a core of course offerings was common among all schools in the study. For example, at least two foreign languages were available to all students in the study. Some students had as many as twelve foreign languages available to them. In science, all students had Biology, Chemistry and Physics courses offered to them. An advanced science course (Biology II, for example) was available to 93.5% of the students. Algebra I, Geometry and Algebra II courses were available to all students and Calculus to 94%.

The amount of diversity in course offerings beyond the common core of courses was most evident in social studies and English. Special topic courses, such as "Dramatic Literature" and "American Legal Systems" are common in each area. In some schools such courses may fulfill a graduation requirement, while in others they are purely elective, and are taken in addition to the prescribed curriculum.

The number of special topic courses available to students varied a great deal. Some students (approximately 14%) had virtually no special topic courses in English available to them. Other students were able to choose from among as many as fifty such courses.

Special topic courses in social studies were available to all students. The number of available courses ranged from three to twenty-one. All special topic courses in social studies were in addition to standard History course offerings, such as U.S. History, World History and Modern European History.

Thus, all students in the study had a core group of similar course offerings available to them. Beyond this core of courses however, course offerings exhibited a substantial diversity. Although the availability of an extensive list of special topic courses may be a factor in student course selection, for the purpose of this study, it is important to note the universal availability of many courses.

The availability of computer courses among schools in the sample deserves particular comment. All but one school in the study (involving 2.1% of the students) offered coursework in computers. Nevertheless, it is not reasonable to state what percentage of the students in the Class of 1984 had a meaningful

opportunity to take a computer course. Access to a computer course is dependent on the amount of hardware available. A student may, therefore, be unable to take a course offered in the school catalog because of enrollment limitations. In addition, although computer courses existed in the 1983/84 school year, the members of the Class of 1984 may not have had access to such a course during all their years of high school.

Moreover, the newness of computer curriculum makes it difficult to discover all the subject areas in which such instruction might occur. For example, a one semester course entitled, "Introduction to Computers," may provide less instruction than a unit of computer programming embedded into a science, mathematics or business course.

Thus, for the purposes of this study, while it is acceptable to note how many students clearly took discrete computer coursework, it is not legitimate to conclude that the rest of the students "chose" not to take such a course or did not receive comparable instruction under another course title.

B. Description of Coursework

A thorough examination of the actual curriculum of high school students should include at least three components: (1) a description of the quantity of time students spend in various subject areas; (2) how this time is balanced among subject areas; and (3) some insight into the quality of the time spent in coursework.

1. Quantity of Time

Data on the quantity of time represented by students' curricula are expressed in a unit of "years of coursework," equal to the standard unit of credit awarded by schools in the study. Massachusetts students averaged 21.9 total years of coursework during their high school experience. Figure 5 shows how these total years of coursework were distributed among the course categories used in the study.

Over 84% of the students took at least 20 years of coursework, which averages to at least 5 courses per year. The graphs in Figures 6 and 7 display the distribution of students taking various years of coursework in each academic subject area.

The average years of coursework in each of the subject areas are displayed below each graph in Figures 6 and 7. During their high school years, Massachusetts students took an average of 16.5 years of coursework in the academic subject areas (English, social studies, science, mathematics and foreign language). Thus, each year, students averaged 5.5 full year courses and 4.1 academic courses.

MEAN YEARS OF COURSEWORK BY SUBJECT AREA

FIGURE 5

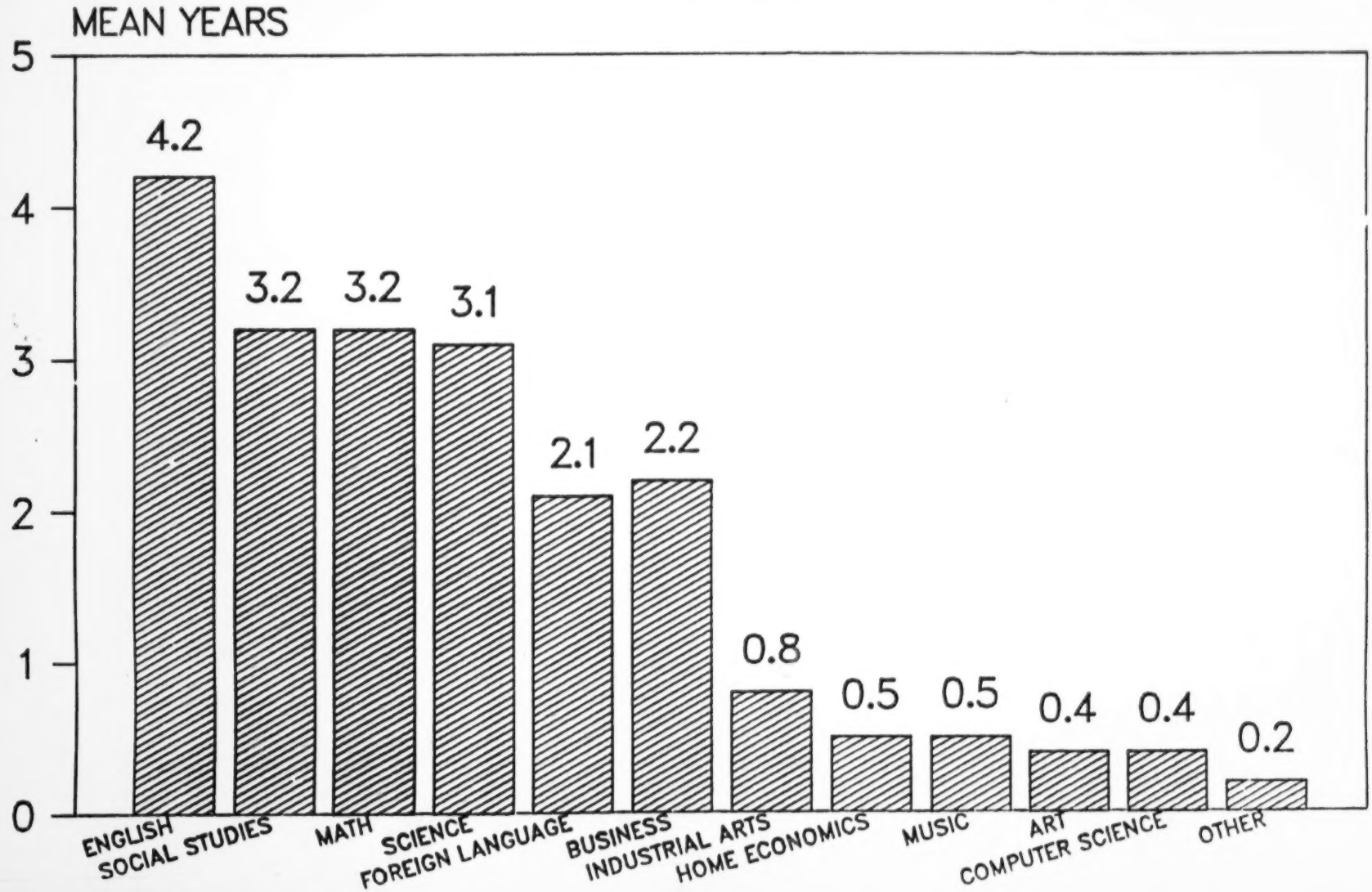
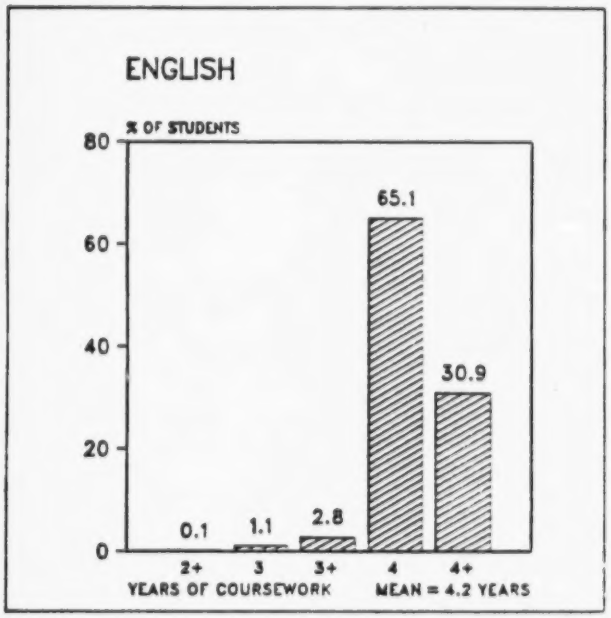
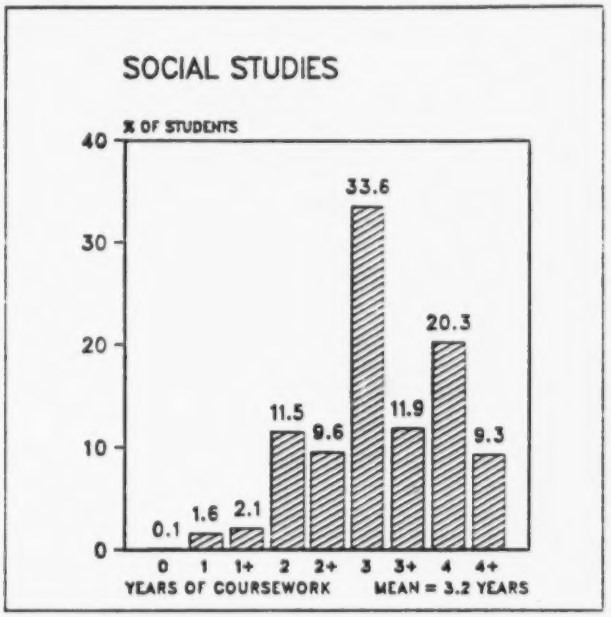
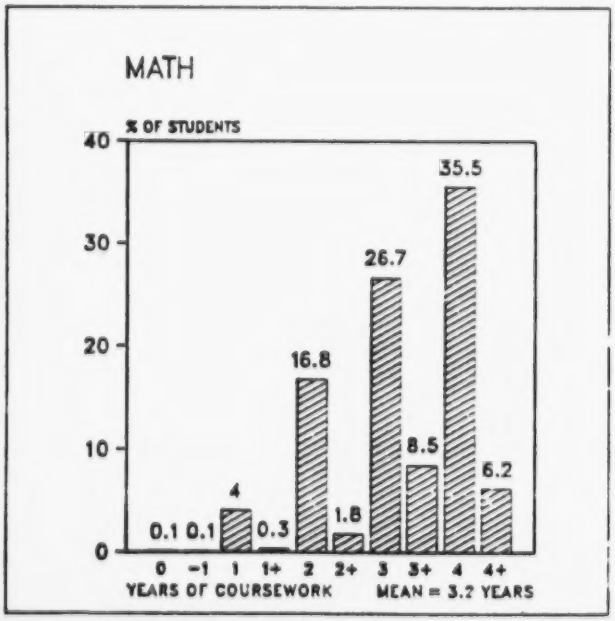


FIGURE 6

DISTRIBUTION OF YEARS OF COURSEWORK BY SUBJECT AREA -- ENGLISH, SOCIAL STUDIES AND MATHEMATICS



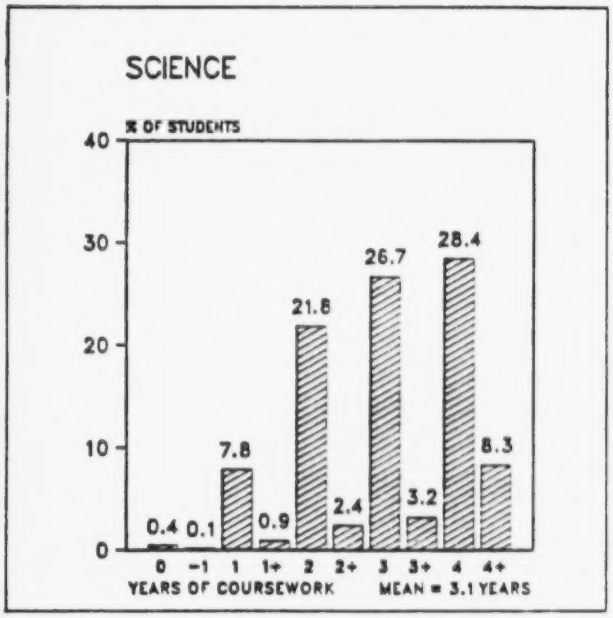


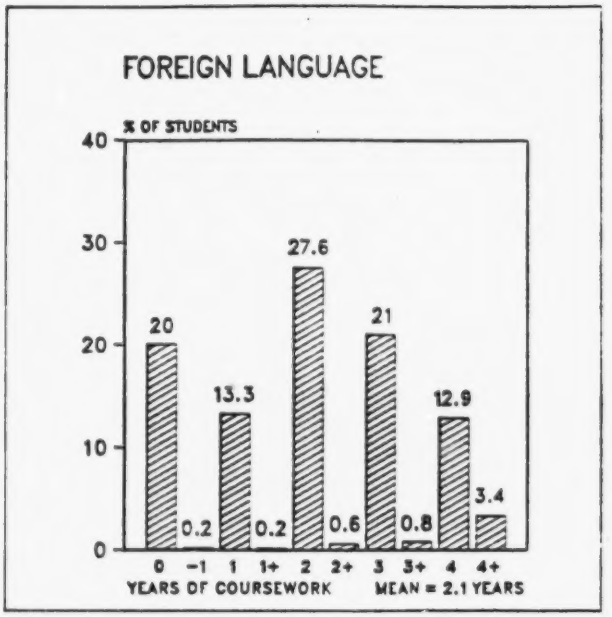


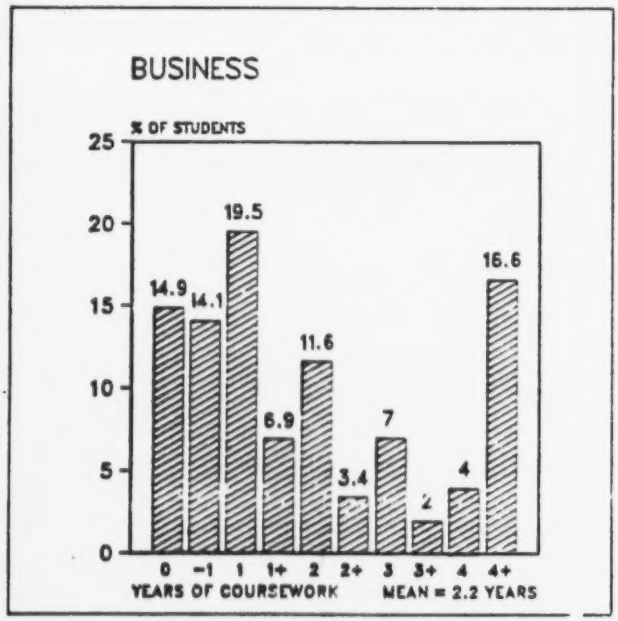
- 96.0% of the students took at least four years of English.
- 75.1% of the students took at least three years of social studies.
- 76.9% of the students took at least three years of mathematics.

FIGURE 7

DISTRIBUTION OF COURSEWORK BY SUBJECT AREA -- SCIENCE, FOREIGN LANGUAGE AND BUSINESS







- 66.6% of the students took at least three years of science.
- 66.2% of the students took at least two years of foreign language.
- 20.6% of the students took at least four years of business.

It is important to note, however, that the average figures for the coursework in any area may mask the distribution of students exhibiting various amounts of coursework. For example, although the average years of foreign language coursework was 2.1, 20% of the students took no coursework in a foreign language. In particular, average years of coursework for subject areas outside the academic areas do not adequately describe the extent of student participation. For those areas, a participation rate - percentage of students who took any coursework in each subject - is more meaningful. These data are provided in Table 2.

TABLE 2

Participation in Non-Academic Coursework

Course	Participation Rate
Industrial Arts	35.3%
Home Economics	34.6%
Music	24.0%
Art	35.7%
Computer Coursework	41.6%

Interpretation of the data describing the quantity of coursework taken by students requires some frame of reference by which to compare the results. Studies analyzing coursework shown on student transcripts have not been conducted very often and, therefore, data that match the Massachusetts figures perfectly are not available. Research revealed no other states that have conducted similar analyses during recent years. Nationally, a transcript study was completed by the National Center for Education Statistics (NCES) for the Class of 1982. However, several important characteristics of that study differ from the Massachusetts study. First, the national sample did not exclude the same categories of students that were excluded from this study. In addition, the methodology of the national study did not employ the same course classification scheme used in this study. Differences between the two studies in the process of course coding further reduce the appropriateness of comparisons between the results of the two studies. Other studies on student course-taking, such as those conducted by the College Board, not only use a different classification process, but also rely on student reported data rather than transcript data.

In general, the available studies of the same phenomenon - students' actual curriculum - do not provide particuarly well-matched data for comparison purposes. However, the comparisons that are available do provide some insight into the nature of Massachusetts' students curricula as compared to students across the nation. Table 3 presents the average years of coursework in various academic subject areas for Massachusetts students and for students across the nation.

TABLE 3

YEARS OF COURSEWORK BY SUBJECT AREA

	MA	NATION
English	4.2	3.8
Social Studies	3.2	3.1
Mathematics	3.2	2.6
Science	3.1	2.2
Foreign Language	2.1	1.1
Total Academic Coursework	16.5*	12.8
Computer Science	.4	.1
Students with ≥3 years of mathematics	76.9%	45.2%
Students with ≥3 years of science	66.6%	30.4%
Students with ≥4 years of English	96.0%	58.6%

* The calculation of this mean involved the summation of all raw data values and is <u>not</u> a composite of the individual subject area means.

The national information in Table 3 was derived from the NCES study noted above, which was based on two very different data sources - student transcripts and self-reported data. Therefore, caution must be taken in comparing the data to corresponding data generated in this study. Nevertheless, it does appear that the curricula of Massachusetts students put a greater emphasis on the academic subject areas.

Further support for the idea that Massachusetts students take a high school curriculum different from that of students in the rest of the nation comes from information from SAT takers. Typically, Massachusetts students report more years of coursework in academic areas in comparison to national figures.

The data on Massachusetts students may reflect regional differences in the nature of a high school education that are evident both in College Board data and national studies. College Board data on years of coursework for students from the New England region are consistently higher than those for the rest of the nation. NCES data on students' descriptions of their program of studies found that 51% of the students in the Northeast identified themselves as "Academic," while no more than 35% assigned themselves to the same category in other regions in the country.

Information on course offerings of high schools throughout the nation provides further support for this conclusion. A NCES report on high school course offerings in 1982 reported that 35% of the schools in the nation offered Physics and 33% offered Calculus. Although the data in this study are not representative of all schools in Massachusetts, the information presented above on course availability among schools in this study suggests that a much higher percentage of schools in Massachusetts offer these courses.

In addition to coursework data, the consistently high percentage (approximately 66%) of Massachusetts students who participate in the SAT program demonstrates that a larger percentage of Massachusetts students intend to attend a post-secondary educational institution. It is not surprising then, that the coursework of Massachusetts students emphasizes more academic courses than does the coursework of students across the nation.

2. Quality of Time

The quantity of time spent in various subject area provides a limited perspective from which to understand high school curriculum. Information on the knowledge represented by this quantity of time is also necessary. This study examined the issue of the nature or level of knowledge represented by coursework in two ways: (1) collecting data on the level at which English, social studies, mathematics and science courses were taken; and (2) analyzing the academic coursework by the specific course taken, not simply the subject area.

Level Analysis

For the purposes of this study, the leveling system used in each school was translated into the five categories of courses described in Section I. Each academic course that appeared on a student's transcript was assigned a category designation. Data on course levels provide a mechanism for evaluating the degree of difficulty represented by the years of coursework in academic subjects. Students took an average of 11.9 courses from categories one and two (college preparatory courses) during their four years of high school. These courses accounted for 53.6% of the total years of coursework averaged by students.

Table 4 presents the average years of college preparatory coursework in each subject area. In addition, the data show the percentage of the total coursework in that subject area represented by college preparatory coursework.

TABLE 4

COLLEGE PREPARATORY COURSEWORK BY SUBJECT AREA

	MEAN YEARS	% OF TOTAL SUBJECT AREA COURSEWORK
English	2.7	64.5%
Social Studies	2.0	61.4%
Mathematics	2.8	82.1%
Science	2.4	71.3%

A larger percentage of mathematics courses were taken at a college preparatory level than the corresponding percentages in other subject areas. Data for all academic subject areas show that a substantial percentage of students' coursework was taken at the most demanding levels.

Specific Coursework

A second perspective on the issue of the knowledge represented by years of coursework in a subject area was obtained by examining how many students took at least one year of coursework in specific courses. This analysis examined courses that traditionally represented a discrete body of knowledge - for example, Algebra I and Chemistry - rather than courses for which the content was likely to vary among schools - such as, English II. Table 5 summarizes the percentages of students who elected various courses during high school.

High percentages of Massachusetts students took coursework in traditional academic subjects. The participation rate of students in Biology, Algebra I and II, and Geometry was above 60% and in Chemistry was slightly below 60%. In each of these subjects, the difference between the rate for Massachusetts students and for students throughout the nation is substantial.

TABLE 5

PARTICIPATION IN SPECIFIC COURSEWORK

	MA	NATION
Biology	87.2%	74.4%
Chemistry	59.7%	24.4%
Physics	29.5%	11.3%
Advanced science	12.6%	Not Available
Algebra I	83.1%	63.1%
Algebra II	64.0%	31.2%
Geometry	74.8%	48.2%
Calculus	13.4%	5.6%

3. Curriculum Balance

The notion of curriculum balance involves the percentage of the total coursework represented by the coursework in each subject area. For example, the fact that students averaged 2.1 years of foreign language coursework needs to be supplemented with information that this represented 9.3% of the total years of coursework averaged by Massachusetts students. Table 6 displays the average years of coursework in each subject area and the percentage of total coursework this represented.

TABLE 6

CURRICULUM BALANCE

	MEAN YEARS	% OF TOTAL COURSEWORK
English	4.2	19.4%
Social Studies	3.2	14.8%
Mathematics	3.2	14.8%
Science	3.1	13.9%
Foreign Language	2.1	9.3%
Business	2.2	10.1%
Industrial Arts	.8	3.7%
Home Economics	.5	2.2%
Art	.4	2.0%
Music	.5	2.2%
Computer Science	.4	1.7%
Interdisciplinary	.02	.08%
Courses Not Elsewhere Classified	.2	.8%

These percentages show the coursework of Massachusetts students to be heavily weighted toward academic areas. With the exception of business, no subject area other than the five academic subjects accounted for more than 4% of students' coursework.

The appropriate balance of coursework in the high school curriculum has not been a major concern of most current reform discussions relating to secondary school education. In previous reform eras, however, this issue has been much more prominent. One of the few current contributors to the idea of curriculum balance, John Goodlad, draws on an earlier recommendation for the composition of the high school curriculum in his 1984 study, A Place Called School. Goodlad uses the five broad categories proposed by the 1945 Harvard report, entitled General Education In A Free Society, as a basis for this model of the ideal curriculum for secondary school students: 1) literature and language (20%); 2) mathematics and science (20%); 3) society and social studies (16.7%); 4) the arts (16.7%); and 5) the vocations (16.7%). He proposes that a student's program (and school resources) be allocated to each category up to a maximum percentage of his total program. In addition, he recommends that two-thirds of the coursework in each category should be required and common to all students. This model suggests the broader question of the purpose of a high school education. It is useful, however, to examine one portion of that proposal and consider how the curriculum of Massachusetts students compares to the Goodlad recommendation. Table 7 compares the appropriate data for Massachusetts students to the Goodlad recommendations.

TABLE 7

COMPARISON OF CURRICULUM BALANCE

	GOODLAD'S RECOMMENDATION	MA STUDENTS
Language and Literature	20%	28.7%
Mathematics and Science	20%	28.7%
Society and Social Studies	16.7%	14.8%
Arts	16.7%	4.2%
Vocations	16.7%	16.0%
Electives	16.7%	NA

Goodlad's plan allows for 16% of a student's program to be elective; students may elect courses from the five categories or from alternative programs to complete their programs. Massachusetts students distributed their coursework in a pattern somewhat different from Goodlad's recommendation. In particular, their academic coursework represented a higher percentage than Goodlad's ideal curriculum. However, the only category that is substantially below the recommendation was the arts. Massachusetts students devoted only 4.2% of their high school program to the study of art or music. The language/literature and mathematics/science areas (each almost 9 percentage points above the recommendation) are closer to the model if the elective 16% is distributed in these two areas. The other two areas, society/social studies and vocations, were slightly below the guidelines suggested by Goodlad.

The appropriate curriculum for high school students has certainly been a subject of much debate since the inception of the American high school. Goodlad's recommendation for a particular curriculum balance is not the only proposal ever articulated, nor the one necessarily supported by most people. It does, however, present a somewhat different way of defining high school requirements. In addition, the idea of curriculum balance encourages the discussion to go beyond the core academic areas and to consider all the components of a high school education.

C. Coursework and Requirements

Knowledge of the actual coursework of high school students allows for an examination of the impact of curriculum requirements designed to influence student course selection. Course requirements established for high school students originate from a number of different sources. Besides state and local minimum time/subject area requirements, college entrance requirements affect the course selection of secondary school students. More than the sometime arbitrary time requirements proposed by curriculum reform reports, college entrance requirements have direct practical implications. These requirements, however, have a purpose that differs from policies establishing minimum requirements. Requirements established by colleges are designed to define a high school preparation adequate for colleges, rather than to set a minimum program that all students must meet.

Although many sets of high school requirements exist, the course selection of Massachusetts students should be evaluated against sets of requirements that are meaningful and relevant to them. One such set of requirements is the set that has been established for the Class of 1987 by the Massachusetts Board of Regents for eligibility for admission to state colleges and universities. The Regents' requirements include a component not

often found in sets of course requirements: courses must be taken at a college preparatory level. These requirements are summarized in Table 8.

TABLE 8

MASSACHUSETTS BOARD OF REGENTS
REQUIREMENTS FOR COLLEGE ADMISSIONS

	YEARS REQUIRED CLASS OF 1987
English	4
Mathematics	3
Science	2
Social Studies	2
Foreign Language	2

As noted, the requirements stipulate that all these courses be taken at a college preparatory level. The diversity in leveling practices among the schools in the study suggests that implementation of the Regents' requirements will necessitate some regulatory guidelines on how schools should translate their level definitions to the Regents' definitions. In the absence of such guidelines, the level categories of the transcript analysis provide a framework for the analysis. The data in Table 9 present the percentages of Massachusetts students in the Class of 1984 who would meet the full set of Regents' requirements at a college preparatory level as well as at any level.

TABLE 9

STUDENTS FULFILLING REGENTS' REQUIREMENTS

	% of Students
All requirements fulfilled at a college preperatory level	24.2%
All requirements fulfilled at any level	53.1%

Table 10 shows what percentage of students would meet each subject area requirement independently at the college preparatory level as well as at any level.

TABLE 10

COURSEWORK AND REGENTS' REQUIREMENTS BY SUBJECT

	% of students meeting requirements at college prep level	% of students meeting requirements at any level
English (4)	41.7%	95.9%
Mathematics (3)	66.0%	76.9%
Science (2)	68.5%	90.9%
Social Studies (2)	58.2%	96.2%
Foreign Language (2)	NA	66.3%

*Foreign language courses were not classified by level.

- Fewer students would meet the requirement of 4 years of college preparatory English than in any other subject area.
- Although a high percentage of students would fulfill the social studies requirement at any level, substantially fewer students would be able to meet the requirement of two college preparatory social studies courses.
- Two-thirds of the students would meet the foreign language requirement at some level.

Analysis of these data indicates the areas in which students would have to increase their coursework if higher percentages of students are to meet the full set of the Regents' requirements.

Table 11 presents the percentage of the students who stated in May of their senior year that they planned to attend a four-year college (52.9% of the sample) who would meet the full set of the Regents' requirements.

TABLE 11

COLLEGE-BOUND STUDENTS FULFILLING REQUIREMENTS

	% of Students
All requirements fulfilled at a college preparatory level	37.3%
All requirements fulfilled at any level	77.1%

The other requirements with direct practical implications for Massachusetts high school students are the minimum graduation requirements established by each school district. These requirements vary a great deal, not only among Massachusetts school districts, but also among states and districts throughout the nation. Since no clear consensus exists as to the "best" set of graduation requirements, the examination of the impact of minimum requirements involved a different approach. The assumption of minimum graduation requirements is that requiring a larger minimum quantity of coursework in a subject area will stimulate students to take more coursework in the desirable subject areas. An extension of this assumption is that students subject to higher requirements experience a more challenging curriculum than those who must fulfill fewer requirements. Knowledge of students' coursework allows an evaluation of these assumptions.

For each subject area, students in the sample were divided into two categories based on the mathematics, science or social studies requirements of the schools they attended. If the assumption underlying graduation requirements holds true, students subject to higher requirements should take more years of coursework than those to whom a lower standard applies. The analysis shows different results for each subject area. These results are summarized in Table 12.

Another important question to address in examining the impact of higher requirments is whether higher requirements result in a higher or a lower level of coursework. Table 12 also provides the results of an analysis of the amount of college preparatory coursework of the two groups defined above.

TABLE 12

COURSEWORK AND REQUIREMENTS

	Students Subject to Higher Requirements	Students Subject to Lower Requirements
Mathematics		Took a greater number of courses Took more college prep courses
Science	Took a greater number of courses No difference in number of college prep courses	
Social Studies	Took a greater number of courses Took more college prep courses	

* Higher requirements in Mathematics and Science = 2 or more years
Higher requirements in Social Studies = more than 2 years

These two analyses indicate that the assumption that higher minimum standards for high school graduation lead to more coursework and more rigorous coursework in the students' total program was true only for social studies courses. Higher requirements are related to more coursework in science but students subject to fewer years of science requirement took the same number of college preparatory science courses as those subject to higher requirements. In mathematics, the opposite of what is predicted by the assumption is evident - students who were required to take fewer than two years of mathematics actually took more years of mathematics coursework and more college preparatory mathematics coursework than students who must take two or more years of mathematics.

These results suggest that student selection of coursework is likely affected by a number of factors other than minimum graduation requirements. Identification of these factors and understanding of how they interact would be useful in establishing policies that would foster the selection of more rigorous courses of study.

IV. COURSE-TAKING PATTERNS

The description of student coursework provided in the previous sections of this report represents the content of a high school education for the typical Massachusetts student. According to the data presented, the average Massachusetts student selected a high school program that included a large amount of academic coursework and a substantial percentage of these courses at a college preparatory level. As suggested by the high participation rate of Massachusetts students in the SAT program, the typical student's program can be characterized as being primarily college preparatory in its emphasis.

A description of the program of the typical student, however, does not provide any insight into the range of coursework patterns taken by students. Within the scope of the comprehensive high school, information on this range is important in order to evaluate the appropriateness of high school curriculum for all students. Recognizing that students in secondary schools are preparing for a variety of post-high school experiences, the comprehensive high school attempts to offer all students a meaningful course of studies and, at the same time, tries to ensure that all students take an acceptable amount of coursework in areas thought to be essential.

The effort of comprehensive high schools to accommodate students with a variety of post-high school plans has typically resulted in two courses of study available to high school students - one appropriate for students preparing for post-secondary education and one for those who are not.

In order to understand high school education, it is necessary to have information on the nature of the curriculum of students participating in each of these courses of study. Analysis of aggregate information, by definition, averages the range of coursework to produce a description of the typical student. Although this type of information is important, unless the elements of different curricula are understood, it is impossible to determine whether the current methods of defining a high school education are appropriate and sufficient for all students.

Analysis of the coursework patterns identified how Massachusetts students directed their curriculum, by the courses they selected, toward the two divergent goals of a high school education. Approximately two-thirds of the students participated in a curriculum that clearly displayed an emphasis on preparation for post-secondary education. The other one-third of the students took coursework that did not. In addition, the curriculum not directed to post-secondary education was further differentiated into two categories - one representing career preparation and the other having no obvious focus.

Within this framework, the analysis of course-taking patterns defined three types of curricula. The description of each is intended to provide the data needed to consider the appropriateness of each pattern of coursework. The following types of curricula were identified for this analysis:

High Academic Curriculum - Coursework was considered to be at the high end of the academic curriculum if it included four or more courses in each of three of four academic subject areas - mathematics, social studies, science and foreign language. (English courses are not included in this definition because of small variation in the amount of English coursework taken by all students.)

Occupational Curriculum - A concentrated occupational program included more than four years of coursework in either business, industrial arts or home economics. (This coursework did not include Chapter 74 vocational education programs.)

Non-directed Curriculum - A pattern of coursework characterized by a large percentage of lower level courses and insufficient academic or occupational courses to be classified in either of the above two categories.

Analysis

The percentage of students in each category is given in Table 13.

TABLE 13

Distribution of Students by Curriculum Category

High Academic	14.2%
Occupational	21.6%
Non-Directed	11.4%

These three categories account for 47.2% of the students. The curriculum of the other 52.8% can be described by the data provided in the aggregate description of course-taking found in Section III of this report. As mentioned previously, the typical student in Massachusetts took a high school curriculum that is college preparatory in its emphasis, characterized by high average years of academic coursework and large amounts of courses at more demanding levels. The 52.8% of the students who do not take a curriculum that matches the definitions of the three categories described above do take coursework that is very similar to that of the typical student.

The purpose of the analysis was to describe the coursework of each group of students in order to determine whether it is legitimate, within the framework of a comprehensive high school, to have a significant group of students taking each program. Although some comparisons among groups are useful, it is not instructive to learn that the coursework of students who concentrate in business, industrial arts or home economics, differs substantially from that of students who concentrate in academic subjects. A more appropriate comparison is to consider how each group's coursework compares to that of the average student.

High Academic Curriculum

The definition of this curriculum identified students whose programs concentrated in academic subjects by taking at least four years of coursework in each of three academic subject areas (excluding English). Table 14 summarizes the characteristics of these students and compares them to the figures for typical students.

Table 14

Characteristics of Students in High Academic Curriculum

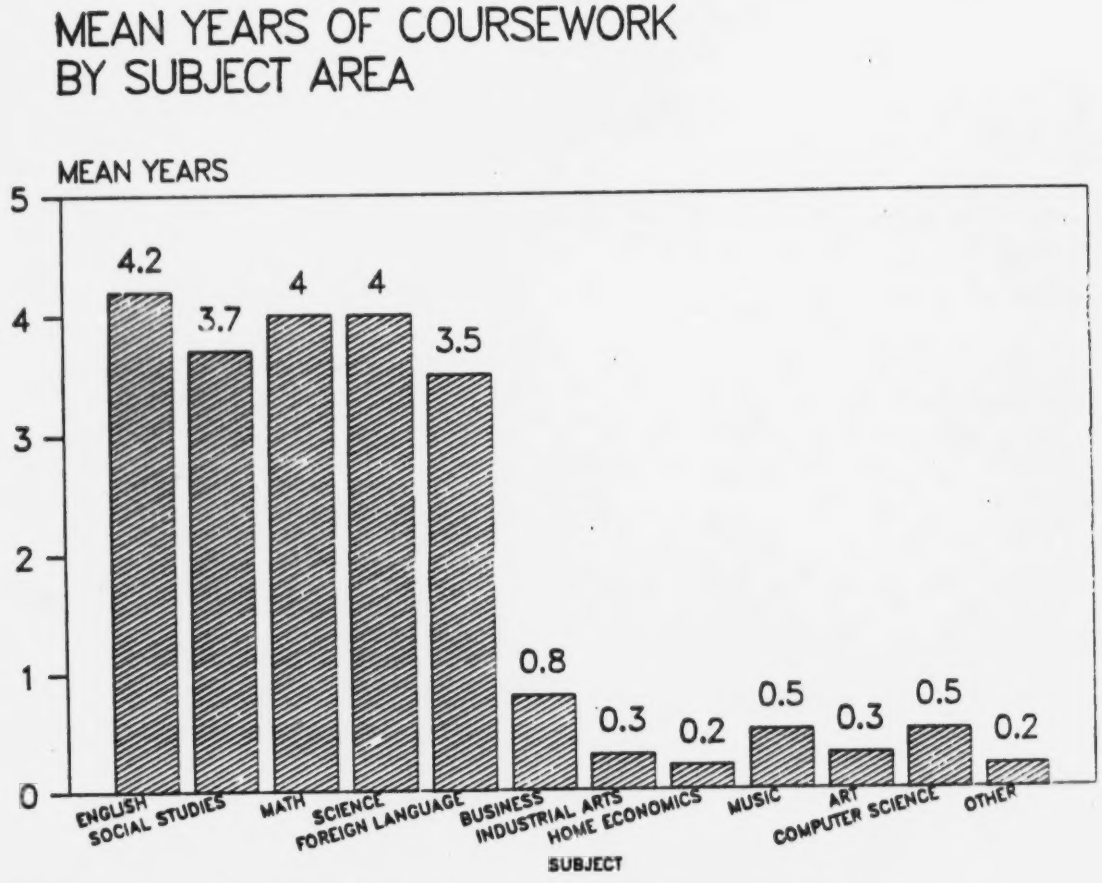
	High Academic	All Students
SAT Verbal	491	438
SAT Math	541	483
SAT Participation Rate	94%	67%
Post High School Plans		
Work	4.4%	19.7%
2-Year College	3.9%	18.3%
4-Year College	87.9%	52.9%
Military	1.9%	4.3%
Other	1.0%	2.4%
No Response	1.0%	2.4%

The characteristics of these students indicate the appropriateness of this definition. These data show clearly that the students whose programs fit this definition had a strong college preparatory orientation as compared to all students in Massachusetts.

The pattern of coursework exhibited by these students indicates the extent to which their high school curriculum paralleled this emphasis. Figure 8 presents the average years of coursework in each subject area for high academic students.

FIGURE 8

HIGH ACADEMIC CURRICULUM



In every academic subject area (excluding English), these students, as expected, took substantially more years of coursework than the average student. Also predictably, this pattern is reversed in the non-academic subject areas. High academic students took substantially less coursework than the average student in areas such as business, industrial arts and home economics. No important difference was evident in the amount of coursework averaged by the two groups of students in art and music. As is true for all students, many high academic students (56.6%) took no coursework in these two areas.

Two areas in which high academic students demonstrated a substantially different participation rate from the average were computer courses and high school level courses taken in Grade 8. Slightly more than 53% of the high academic students took some computer coursework during high school. Among all students fewer than 42% took computer courses. High academic students were thus more likely to have included computer coursework in their programs than the average student.

Courses taken in the eighth grade reflect coursework that is typically offered in high school but which a student has completed successfully prior to entering the ninth grade. Algebra I and the first year of a foreign language are often available to accelerated students at the junior high school level. Of the high academic students, slightly more than half completed high school work in the eighth grade, primarily in foreign languages. Among all students, approximately one-third participated in these accelerated programs. This comparison suggests that the identification of high academic students often occurs prior to high school.

The percentage distribution of the coursework of high academic students shows a heavy emphasis in academic areas. Table 15 displays the average percentage of total coursework represented by each subject area for high academic students and for all students.

TABLE 15

Curriculum Balance --
High Academic Curriculum

	High Academic	Typical Student
English	17.7%	19.4%
Social Studies	16.0%	14.8%
Mathematics	17.3%	14.8%
Science	17.3%	13.9%
Foreign Language	14.8%	9.3%
Business	3.6%	10.1%
Industrial Arts	1.2%	3.7%
Home Economics	.7%	2.2%
Art	1.2%	2.0%
Music	2.0%	2.2%

- 83% of the total coursework taken by high academic students was in academic subject areas as compared to 72% for the typical student.

In comparison with Goodlad's prototype of curriculum balance, the high academic students took a disproportionate amount of their coursework in academic areas - mathematics/ science, language/literature, society and social studies. Concentration in these areas was at the expense of coursework in the arts and vocations, areas in which the high academic students were below the average figures for all students.

The coursework of high academic students was also concentrated in higher level courses. Table 16 presents the percentage of college preparatory courses in each subject area for high academic students.

TABLE 16

College Preparatory Coursework by Subject Area -- High Academic Curriculum

	Mean Years	% of Total Subject Area Coursework
English	3.4	81.6%
Social Studies	3.0	81.1%
Mathematics	3.95	97.9%
Science	3.7	90.8%

In each subject area, the percentage of college preparatory courses for the high academic students was above 80%. For the typical student, in only one subject area - mathematics, did the percentage of college preparatory courses reach that level. Not only did high academic students take a large number of courses in academic subjects, they also took them at a more demanding level. High academic students averaged almost 25% of their academic courses at the highest level of difficulty and approximately 88% at some college preparatory level

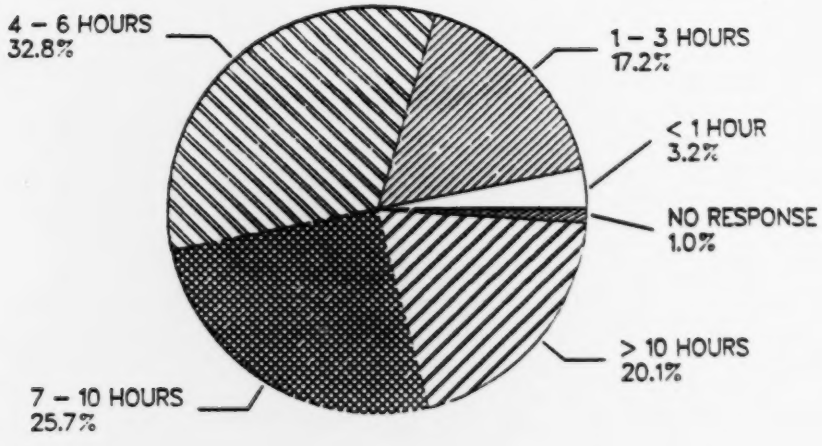
This description of the coursework of high academic students demonstrates the existence of a course of studies quite different from the average among certain select high school students. Information on the amount of homework and on the paid employment of these students provides further insight into their high school experience.

Figure 9 displays the responses to the question on amount of time spent on homework for high academic students.

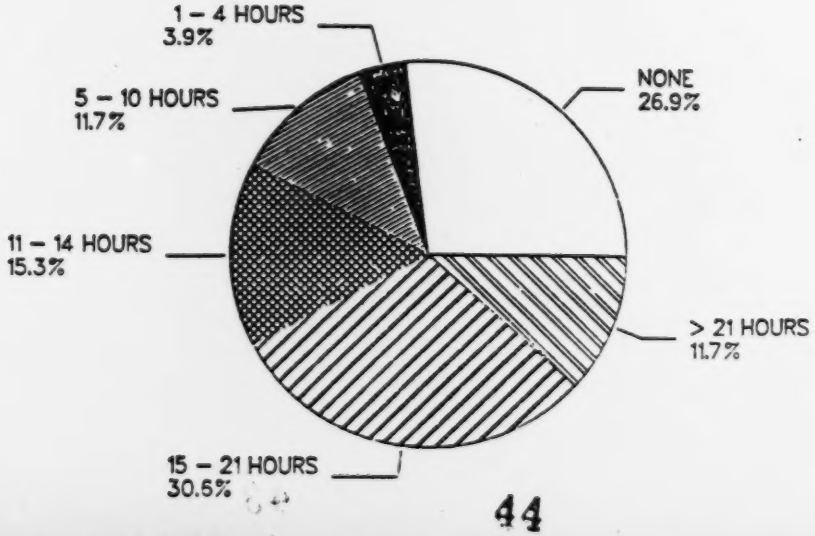
FIGURE 9

HIGH ACADEMIC CURRICULUM

HOURS OF HOMEWORK



HOURS OF PAID EMPLOYMENT



One-fifth of the high academic students reported doing more than 10 hours of homework per week as compared to fewer than 8% of all students. At the lower end of the scale, a similar difference occurred. Almost 42% of all students indicated spending fewer than 4 hours on homework per week (including during study halls), while only 20.4% of the high academic students reported doing this amount of homework. High academic students spent a much greater amount of their time doing homework than did the typical student.

The data on the amount of paid employment each week show a smaller difference between high academic and typical students. Figure 9 summarizes the responses to the question on paid employment.

Slightly more than one-quarter of the high academic students reported no paid employment, while one-fifth of all students reported not working. Among all students, almost 54% worked more than 14 hours per week. Of the high academic students, 42.3% worked this amount. These figures indicate that, even for the most academically oriented students, paid employment accounted for a substantial portion of a high school student's week.

Occupational Curriculum

An occupational course of studies was defined by taking more than 4 years of coursework in one occupational area - business, industrial arts or home economics. By this definition, a student whose curriculum was classified as occupational had to take at least two occupational courses in at least one semester of high school. Concentration in a course of studies directed toward something other than post-secondary education represents one path through a comprehensive high school. (This definition should not be confused with the program of studies of students enrolled in a vocational education program defined by Chapter 74. These students were not included in the scope of this study.) Slightly more than one-fifth of students selected this type of a high school program. The description that follows provides information on the overall coursework of these students as compared to the typical student.

Table 17 summarizes some characteristics of occupational students. As expected, students who concentrated in business, industrial arts or home economics were less academically oriented than the average students.

TABLE 17

Characteristics of Students in Occupational Curriculum

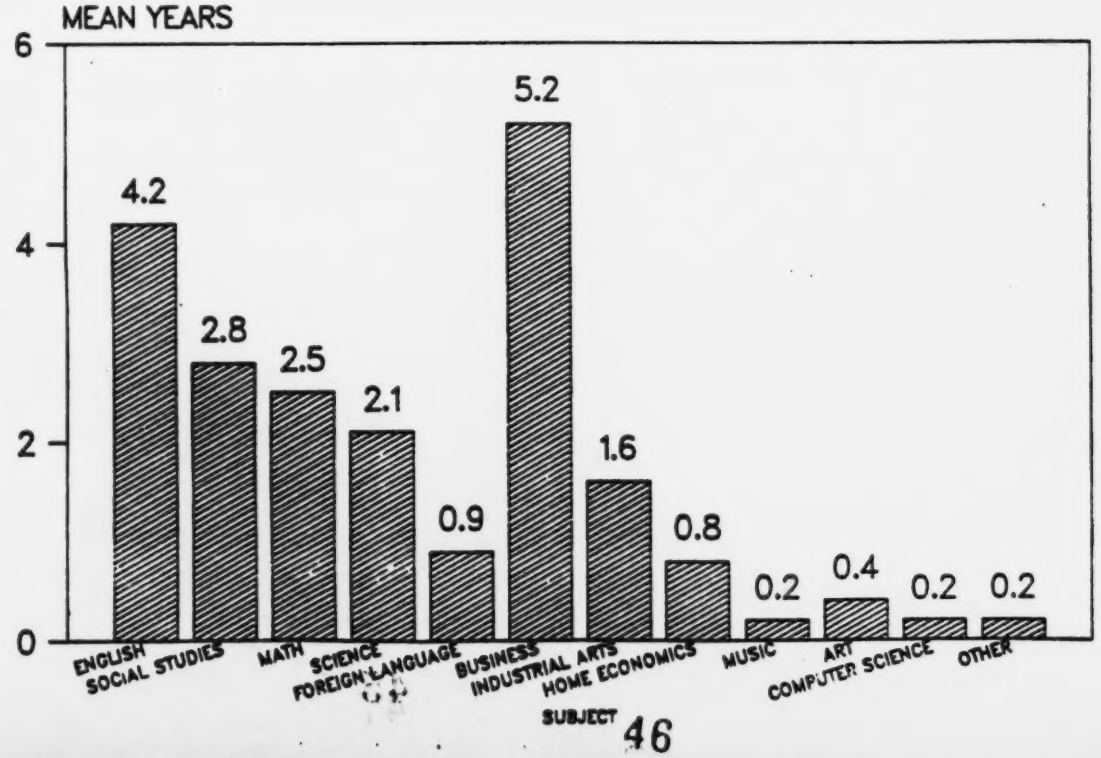
	Occupational Students	All Students
SAT Verbal	355	438
SAT Math	388	483
SAT Participation Rate	29.5%	67%
Post High School Plans		
Work	42.0%	19.7%
2-Year College	32.5%	18.3%
4-Year College	13.9%	52.9%
Military	5.3%	4.3%
Other	2.5%	2.4%
No Response	3.8%	2.4%

The data on the average years of coursework by subject document this point. Figure 10 presents the average years of coursework by subject area that characterize an occupational curriculum.

FIGURE 10

OCCUPATIONAL CURRICULUM

MEAN YEARS OF COURSEWORK BY SUBJECT AREA



Students in an occupational curriculum averaged approximately 4 fewer years of academic coursework than the typical student. Smaller amounts of mathematics, science and foreign language coursework accounted for most of this difference. This decrease in academic coursework was somewhat balanced by an increase in business, industrial arts and home economics.

Predictably, occupational students demonstrated an above average amount of coursework in non-academic areas. In particular, occupational students averaged substantially higher amounts of coursework in business (5.2 years) than did the average student.

Approximately 22% of the occupational students participated in computer coursework. Overall, 42% of the students took computer coursework. This differential access to computer coursework among groups of students indicates that instruction in computers is more likely to occur among students preparing for post-secondary education and less likely to occur among students preparing for an occupational career.

The percentage distribution of coursework among the subject areas for occupational students is compared to the average student in Table 18.

TABLE 18

Curriculum Balance --
Occupational Curriculum

	Occupational Student	Typical Student
English	19.3%	19.4%
Social Studies	12.7%	14.8%
Mathematics	11.3%	14.8%
Science	9.5%	13.9%
Foreign Language	4.0%	9.3%
Business	23.7%	10.1%
Industrial Arts	7.4%	3.7%
Home Economics	3.5%	2.2%
Art	1.6%	2.0%
Music	.8%	2.2%

Occupational students devoted substantially less of their total program to academic subjects than the average. Their concentration in an occupational area was at the expense of coursework in the academic subjects. In particular, occupational students devoted almost 24% of their time to instruction in business subjects.

Information on the quantity of time must be accompanied by insight into the level of the coursework that the time represents. Table 19 provides the data on the amount of coursework taken at more demanding levels. Occupational students took 27.6% of all their coursework at college preparatory levels. Fewer than half of their academic courses were taken at a college preparatory level.

Table 19

College Preparatory Coursework by Subject Area -- Occupational Curriculum

	Mean Years	% of Total Subject Area Coursework
English	1.7	40.2%
Social Studies	1.0	36.9%
Mathematics	1.5	60.4%
Science	1.0	45.3%

Analysis of the coursework of occupational students suggests several conclusions about their curriculum. First, the programs of students who concentrated in occupational areas represented a substantially different course of studies as compared to that of the average student. The amount and level of academic coursework was much lower than average and the distribution of their total coursework was different from that of the average student.

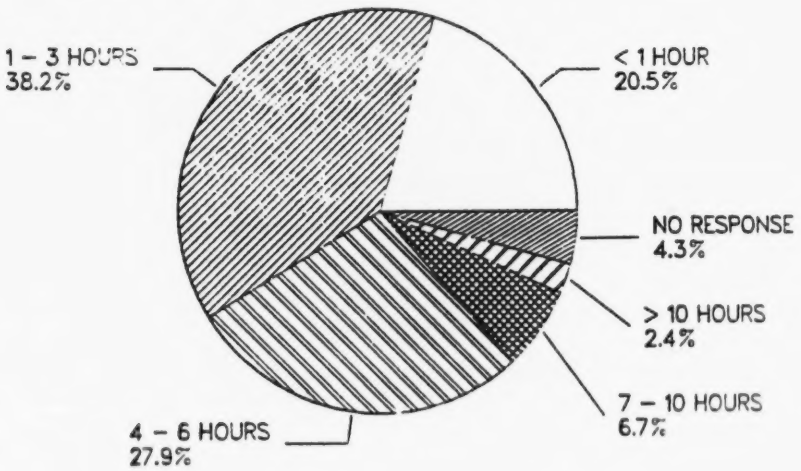
Occupational programs reflected a more focussed pattern of coursework, emphasizing preparation for a career. In particular, a large group (76%) of occupational students concentrated in business subjects. These business students averaged 6.5 years of coursework in business subjects, with 4.7 years or almost 80% of this amount in skill courses such as typing, shorthand and bookkeeping.

The responses of occupational students to the questions on paid employment and homework are useful in describing their high school experience. Figure 11 summarizes the distribution of responses to each question for occupational students.

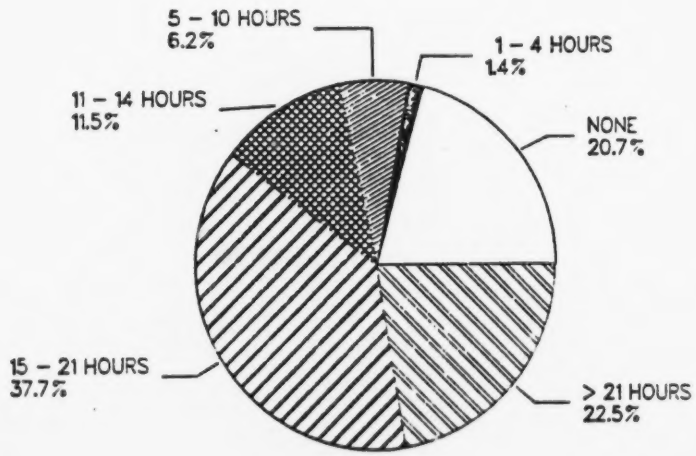
FIGURE 11

OCCUPATIONAL CURRICULUM

HOURS OF HOMEWORK



HOURS OF PAID EMPLOYMENT



The majority (almost 60%) of students in an occupational curriculum reported doing no more than 3 hours of homework per week. Slightly more than 9% averaged more than seven hours of homework per week. The distribution of responses to this question was skewed to the lower amount of homework categories as compared to average students.

The amount of paid employment of occupational students was very similar to that of the typical student. Almost an identical percentage (20.7%) of occupational students reported not working during high school.

Non-Directed Curriculum

A non-directed curriculum consisted of coursework which included a large number of lower level courses and lacked an obvious focus in either an academic or occupational direction. As was true with the other groups identified by this analysis, these non-directed students' curriculum differed from the other patterns of coursework. The characteristics of the students participating in this type of curriculum are provided in Table 20.

TABLE 20

Characteristics of Students in Non-Directed Curriculum

	Non-Directed Students	All Students
SAT Verbal	323	438
SAT Math	370	483
SAT Participation Rate	26.9%	67%
Post High School Plans		
Work	42.6%	19.7%
2-Year College	22.7%	18.3%
4-Year College	17.8%	52.9%
Military	10.3%	4.3%
Other	3.9%	2.4%
No Response	2.7%	2.4%

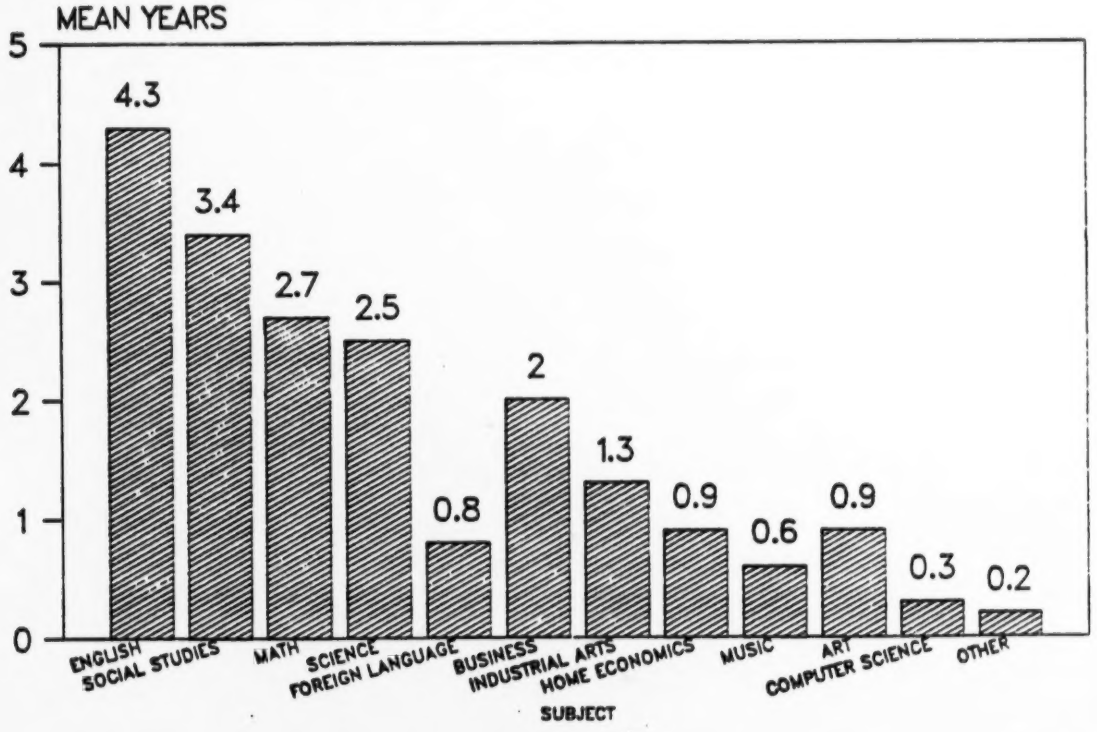
As compared to the mean, the post-secondary plans of these students were more heavily directed toward work, with only approximately 40% of the students planning on post-secondary education. More than twice as many of the students taking a non-directed curriculum indicated military service as their post-high school plans as compared to typical Massachusetts students.

The average years of coursework reflected in a non-directed curriculum were similar to the mean data in some subject areas but not in others. Figure 12 presents the mean years of coursework by subject area for these students.

FIGURE 12

NON-DIRECTED CURRICULUM

MEAN YEARS OF COURSEWORK BY SUBJECT AREA



Non-directed students took an average amount of coursework in English, social studies and business and below average in mathematics, science and foreign language. Their coursework did include more industrial arts, home economics, music and art courses than did that of the typical student.

Table 21 presents the distribution of the total coursework among each subject area. These percentages indicate a curriculum that was more evenly distributed among all subject areas as compared to the average student.

TABLE 21

Curriculum Balance --
Non-Directed Curriculum

	Non-Directed Student	Typical Student
English	21.2%	19.4%
Social Studies	16.4%	14.8%
Mathematics	13.3%	14.8%
Science	12.0%	13.9%
Foreign Language	3.8%	9.3%
Business	9.6%	10.1%
Industrial Arts	6.3%	3.7%
Home Economics	4.4%	2.2%
Art	4.1%	2.0%
Music	3.0%	2.2%

As expected by its definition, the non-directed curriculum included a small percentage of college preparatory coursework. Students taking this pattern of coursework took more than three-fourths of their academic courses at a non-college preparatory level. Table 22 presents the percentages of college preparatory coursework by subject area.

TABLE 22

College Preparatory Coursework
by Subject Area --
Non-Directed Curriculum

	Mean Years	% of Total Subject Area Coursework
English	.5	11.3%
Social Studies	.5	14.7%
Mathematics	1.4	48.2%
Science	.7	25.2%

This particular curriculum was defined as having less than 50% of the academic coursework at a college preparatory level and, thus, these percentages are expected to be below the mean. The data show the college preparatory coursework in two subject areas - English and social studies - was substantially below this criteria, representing no more than 15% of the total coursework in those two subjects. The level of coursework represented by the non-directed curriculum was significantly lower than that of all groups of other students.

The non-directed curriculum reflected a different combination of quality and quantity characteristics from that of the other coursework patterns. The curriculum described above incorporated a slightly lower total amount of coursework, a different distribution among subject areas and a particularly low level of coursework. In addition, by definition, this curriculum would not include a substantial amount of occupational coursework.

Figure 13 presents the data on the amount of time spent on homework and paid employment of students in a non-directed curriculum. The amount of time spent on homework reported by most of these students was on the lower end of the scale. Almost 60% of these students spent fewer than four hours of homework per week. Fewer than 1% reported doing more than ten hours of homework per week.

The information on paid employment followed a pattern similar to that of other groups of students. Approximately one-fourth of the non-directed students indicated no paid employment and a majority (55%) reported working at least fifteen hours per week.

Discussion

The description of the coursework for each of the groups defined above provides insight into the range of coursework patterns that results from the comprehensive high school experience. High schools typically do not establish an explicit tracking system - i.e., most schools in the study did not identify students as "academic" or "occupational" by including a designation on a student's transcript. In theory, all courses offered by the high school are available to all students regardless of their post-high school plans. However, the description of the patterns of coursework indicates that significant numbers of students do take discrete curricula that are substantially different from the norm. These patterns can be characterized as academic or occupational in their emphasis. In addition, a pattern of coursework representing the non-directed high school curriculum is evident from the data.

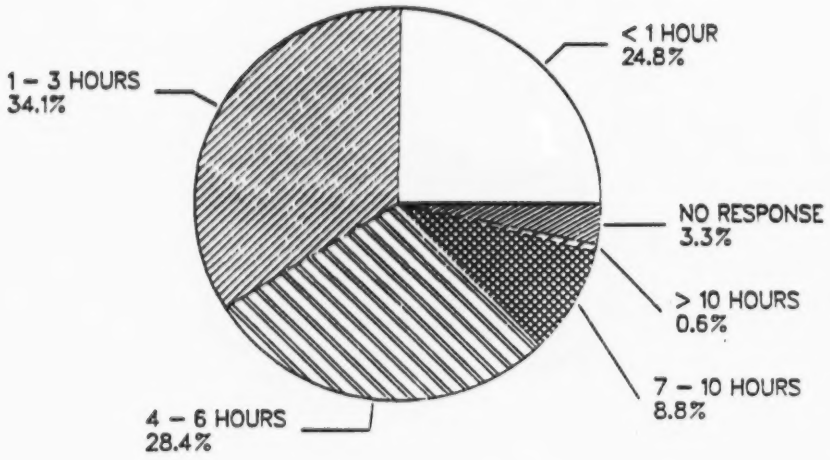
The nature and amount of knowledge reflected in each coursework pattern differed substantially. The coursework of high academic students was heavily concentrated in high level academic courses. Occupational students took less academic coursework at a less demanding level, and concentrated primarily in business skills courses.

Within the definition of the comprehensive high school such differentiation of coursework is certainly expected. The important question raised by this description is whether each pattern includes a satisfactory level of coursework and knowledge in subject areas considered to be important to all.

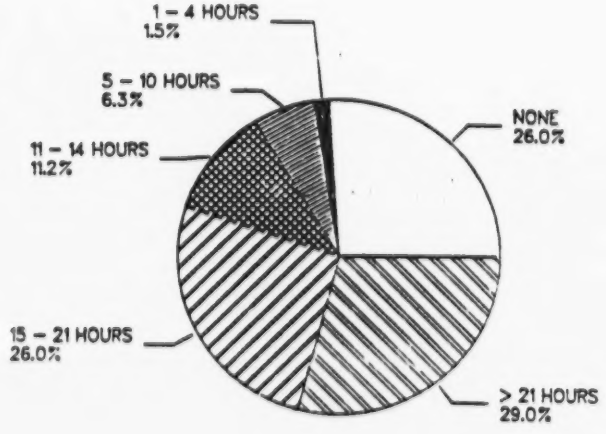
FIGURE 13

NON-DIRECTED CURRICULUM

HOURS OF HOMEWORK



HOURS OF PAID EMPLOYMENT



V. SUMMARY

The courses chosen by Massachusetts high school students have been described in two ways. First, an overall description of the coursework taken by the typical student was detailed. This description documents an average pattern of coursework characterized by an academic and college preparatory emphasis. The second approach to describing the curriculum of Massachusetts students involved identifying patterns of coursework representing the different paths available in a comprehensive high school - academic and occupational. In addition, the analysis identified a pattern of coursework that represents the non-directed high school curriculum. Each of these patterns exhibited a different combination of quantity and quality of coursework.

The findings of this study raise the following questions:

- Is the amount and distribution of coursework in each curriculum path acceptable within the definition of an appropriate high school education for all students?
- In particular, should policies be developed that address the low participation of Massachusetts students in courses in the arts?
- Given an indication that policies establishing minimum amounts of coursework in particular areas may not produce the intended effect, what alternative policy prescription should be instituted to influence the quality and quantity of student course selections?
- How will high school curriculum change in response to new college admissions standards?

Consideration of these and other questions requires additional information related to the course-taking described in this report. The second volume of the report will address the following specific questions:

- How are students with various social and demographic characteristics distributed among various coursework patterns?
- How do tracking practices operate in secondary schools?
- What is the variation in the content represented by student coursework?
- What are the policy implications of differential access to patterns of coursework?